

84. (As Filed) The device of claim 66, wherein said second insulating layer comprises a second oxide layer.

85. (As Filed) The device of claim 66, wherein said second plurality of contact holes are formed by a photoresist process.

86. (As Filed) The device of claim 66, wherein said second plurality of contact holes are formed by a wet etch process.

87. (As Filed) The device of claim 66, wherein said second plurality of contact holes are formed by a dry etch process.

88. (Previously Once Amended) The device of claim 66, wherein said second plurality of contact holes are filled by a CVD process.

REMARKS

Claims 1-28, 30-39, 41-43, 45-70, 72-80 and 82-88 remain pending in this application. The specification has been amended adding a paragraph. Reconsideration of the subject application as amended is respectfully requested.

OBJECTIONS TO SPECIFICATION UNDER 37 CFR 1.71

The specification is objected to under 37 CFR 1.71 because it fails to disclose a method using a wet and/or dry etch to get the contact holes "having a tapered upper portion" that is exemplified only by Applicant's figures. Office Action of 3/23/01 at pg. 2. Applicant respectfully disagrees. However, to move prosecution forward, Applicant amends the specification to include an extended written description of what is illustrated in Figs. 2, which was filed with the original application. In amending the specification, no new matter is added. More specifically, Applicant amends to include the following paragraph:

Referring to Fig. 2A, in one embodiment of the present invention, a photoresist film is used to cover first insulating oxide layer 6. The photoresist film is then processed to create the contact pattern mask. Contact holes 30 are formed in first insulating oxide layer 6 as illustrated in Fig. 2A. The portion of contact holes 30 nearest gate electrode 5 or junction 2 are generally vertical. In some embodiments, such portions of the contact holes are at about a 90 degree angle to the top surface of silicon substrate 1. The upper portion of contact holes 30 are tapered as illustrated in Fig. 2A. In some embodiments, the taper extends from the center of contact holes 30 outward at approximately a 45 degree angle relative to the top surface of silicon substrate 1. In some embodiments, contact holes 30 are formed as illustrated in Fig. 2A using a combination of wet and dry etches. In a particular embodiment the process of forming contact holes 30 includes performance of a wet etch followed by a dry etch to form contact holes 30 as illustrated in Fig. 2A. In another embodiment, the process of forming contact holes 30 includes performance of a dry etch followed by a wet etch to form contact holes 30 as illustrated in Fig. 2A. In yet other embodiments, contact holes 30 as illustrated in Fig. 2A are formed using only a wet etch or a dry etch.

It is stated that “[p]resumably, the figures do not accurately show the claimed ‘tapered upper portion’ . . .” Office Action of 3/23/01 at pg. 2. Applicant respectfully disagrees with this presumption and directs attention to the affidavit of Hun Do Kim. In the affidavit, one of the joint inventors states that “Figure 2A . . . provides an accurate profile of the disclosed invention as claimed. The contact hole profile as illustrated in Fig. 2A comprises a generally vertical lower section with a tapered upper portion.” Affidavit at ¶ 4. Applicant notes the statements indicating that Applicant discloses a different method than the prior art, however, Applicant does not agree that such differences can form an adequate basis to assert that Applicant’s specification is not enabling. Stated another way, a patent can be properly enabled where it does something in a different way than that which is taught in the prior art. Thus, at least because of the amended specification and for the aforementioned reasons, Applicant respectfully requests withdrawal of the objection based on 37 CFR 1.71.

Additionally, “the specification is objected to under 37 CFR 1.71 because it fails to disclose how ‘selective tungsten’ is formed ‘in one single step’ or in ‘a continuous step’ as in claims 5 and 10. Office Action of 3/23/01 at pg. 3. Applicant respectfully disagrees. The contact holes 30 illustrated in Fig. 2A are filled with a selective tungsten film as illustrated in Fig. 2B. The process is described in U.S.Pat.No. 5,683,938 at col. 3, lns. 36-42. For at least this reason, Applicant respectfully requests withdrawal of the objection.

CLAIM REJECTIONS UNDER 35 U.S.C. § 112, FIRST PARAGRAPH

Claims 1-28, 30-39, 41-43, 45-70, 72-80 and 82-88 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one of ordinary skill in the art to which it pertains to make and/or use the invention. Office Action of 3/23/01 at pg. 3. More specifically, the claims are rejected because one of ordinary skill in the art would not know how to make and/or use a tapered upper portion or filling a contact hole in a single step. Id. Applicant respectfully traverses the rejection.

Applicant submits the affidavit of Hun Do Kim stating that forming a contact hole depicted as having a tapered upper portion as illustrated in Fig. 2A of the Application using a wet and/or dry etch can be done by one of ordinary skill in the art without requiring undue experimentation as of the filing date. Affidavit at ¶ 5.

Additionally, the affidavit states that filling the contact hole having a tapered upper portion as illustrated in Fig. 2A of the Application in one single step can be done by one of ordinary skill in the art without requiring undue experimentation as of the filing date. Affidavit at ¶ 7.

Further, Applicant respectfully notes that the rejection mischaracterizes Applicant's prior arguments with regard to the single step filling process. While the mischaracterization is moot in light of the affidavit, Applicant does, however, respectfully request more careful characterization of Applicant's previous arguments if any further rejection is still necessary.

DRAWING REJECTION UNDER 37 CFR 1.83(a)

Next, the drawings are objected to under 37 CFR 1.83(a) because they fail to show the contact hole profile "having tapered upper portions known in the art." Office Action of 3/23/01 at pg. 4. Applicant respectfully traverses the objection.

Specifically, 37 CFR 1.83(a) states that a "drawing in a nonprovisional application must show every feature of the invention specified in the claims." As just one example, Fig. 2A clearly shows the contact holes 30 having tapered upper portions as provided in various claims. It is not relevant that the figures "fail to show the contact hole profile

'having tapered upper portions' known in the art." Office Action of 3/23/01 at pg. 4. Indeed, if such a standard was relevant, to be acceptable all patent application drawings would have to find their basis in the prior art. Said another way, a patent including original drawings depicting original inventions could not be granted. Of course, this is not so. Thus, for at least this reason, Applicant respectfully requests withdrawal of the objection based on 37 CFR 1.83(a).

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

Claims 11-28, 30-39, 41-43, 45-70, 72-80 and 82-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gutierrez in view of the combination of Kim et al., Fink & Christiansen, Sery et al., Park, and Wolf. Applicant respectfully traverses the rejection by noting that Sery et al. is not prior art.

Sery et al. was filed July 1, 1993 and claims priority to an abandoned application with a priority date of Dec. 6, 1991. In comparison, the present Application was filed October 24, 1994 and claims priority to a foreign application filed Oct. 21, 1991. Accordingly, for at least this reason, Applicant respectfully requests withdrawal of the rejections based on 35 U.S.C. § 103 and allowance of claims 11-28, 30-39, 41-43, 45-70, 72-80 and 82-88.

Indeed, Sery et al. undermines any argument that Gutierrez does not inherently show "opening holes to the gate" as it notes that only after Applicant's filing is there evidence of this assertion. Compared to Office Action of 3/23/01 at pg. 5.

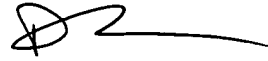
Similarly, claims 1-10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Gutierrez in view of the combination of Kim et al., Fink & Christiansen, Sery et al., Park, and Wolf and further in view of Flanner. Applicant respectfully traverses the rejection by noting that Sery et al. is not prior art. Hence, Applicant respectfully requests withdrawal of the rejection and allowance of claims 1-10.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,



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